REMARKS

I. Status Summary

Claims 2-18 are pending in the present application. Claims 2, 5-7, and 12-18 have been amended. Claims 3, 9, and 11 were canceled. New Claim 19-21 were added. Therefore, upon entry of this Amendment, Claims 2, 4-8, 10, and 12-21 will be pending. No new matter has been introduced by the present amendment. Reconsideration of the application as amended and based on the arguments set forth hereinbelow is respectfully requested.

Claims 2, 5-7, and 12-18 have been amended to place the claims in better format.

II. Claim Objections

The Examiner objected to Claim 5 because the phrase "the adder" has no antecedent basis. (Official Action, page 2.) Claim 5 has been amended to replace the phrase "the adder" with the phrase "an adder". Applicants respectfully submit that the objection to Claim 5 is obviated by the amendment to the claim and should be withdrawn.

III. Claim Rejections Under 35 U.S.C. §102

Claims 2, 4-8, 10, and 12-18 stand rejected under 35 U.S.C. § 102(b) as being anticipated by U.S. Patent No. 5,805,093 to Heikkilä et al. (hereinafter, "Heikkilä"). This rejection is respectfully traversed.

Claim 2 recites a quantizer for a sigma delta modulator comprising at least one preliminary stage. Further, Claim 2 recites that the quantizer quantizes an input signal in accordance with at least one threshold signal and outputs a result value at a digital result output. Claim 2 also recites that the quantizer has a number of comparators corresponding to the number of threshold signals, which compare the input signal with the respective threshold signal. Further, Claim 2 recites that the threshold signal being reduced or increased by a correction voltage or a correction current. The correction voltage or correction current is generated in accordance with the result value output as the result output. Claim 2 also recites that a number of comparators corresponding to the resolution of the quantizer is provided. Further, Claim 2 recites that the comparators have uniformly graduated threshold voltages or threshold currents.

The Examiner contends that Figures 1 and 5 and the corresponding description of Heikkilä teach the features of Claim 2. (Official Action, pages 2-4.) Referring to Figure 1 of Heikkilä, a sigma-delta modulator is illustrated. The modulator of Figure 1 includes integrator stages **H1-H5**, a quantizer **15**, a comparator **25**, and a switching means **20**. (Heikkilä, column 2, lines 42-47.) As shown in Figure 1 of Heikkilä, quantizer **15** receives an output signal of integrator stage **H5** as its input signal and generates an output signal **DOUT**. Heikkilä provides no disclosure of how quantizer **15** functions. Further, Heikkilä does not disclose that quantizer **15** contains a comparator or the operation of any such comparator. In contrast, Claim 2 recites functionality of the claimed quantizer and that the quantizer includes a number of comparators.

Further, referring to Figure 1 of Heikkilä, Heikkilä discloses a single comparator **25** which monitors an output signal of an integrator stage **H5**, compares it to a predetermined threshold value **REF**, and outputs a control signal **26** when threshold value **REF** is exceeded. (Heikkilä, column 3, lines 15-20.) Control signal **26** does not correspond to a digital result output, as required by Claim 2. In contrast, comparator **25** shown in Figure 1 receives as input only a single constant threshold signal **REF** at its inverting input terminal. There is no disclosure that threshold signal **REF** is being reduced or increased by a correction voltage or correction current as recited by Claim 2. Further, even considering if it could be argued that the control signal corresponds to a result output signal as recited by Claim 2, there is no teaching in Heikkilä that threshold signal **REF** changes in dependence on a correction voltage or a correction current, as required by Claim 2.

Figure 5 of Heikkilä illustrates a feed-forward modulator. The modulator of Figure 5 does not teach a comparator or a quantizer that operates with variable threshold signals, as required by Claim 2. As shown in Figure 2, comparator **59** receives a constant reference signal **REF**, not a variable threshold signal as required by Claim 2.

For the above reasons, Applicants respectfully submit that Heikkilä fails to disclose each and every feature recited by Claim 2. Accordingly, it is respectfully submitted that the rejection of Claim 2 under 35 U.S.C. § 102(b) should be withdrawn and the claim allowed at this time.

Claim 4 depends from Claim 2. Therefore, the comments presented above relating to Claim 2 apply equally to Claim 4. Thus, Claim 4 is believed to be patentably distinguished over Heikkilä. Applicants respectfully request that the rejection of Claim 4 under 35 U.S.C. § 102(b) be withdrawn and the claim allowed at this time.

Similar to Claim 2, each of independent Claims 5-7 and 12-18 recite a quantizer for a sigma delta modulator comprising at least one preliminary stage. Further, each of Claims 5-7 and 12-18 recite that the quantizer quantizes an input signal in accordance with at least one threshold signal and outputs a result value at a digital result output. Further, the quantizer has a number of comparators corresponding to the number of threshold signals, which compare the input signal with the respective threshold signal. Each of Claims 5-7 and 12-18 also recite that the threshold signal is reduced or increased by a correction voltage or a correction current. The correction voltage or correction current is generated in accordance with the result value output as the result output. For the reasons provided above, applicants respectfully submit that Heikkilä does not teach each of these features. Therefore, the comments presented above relating to Claim 2 apply equally to Claims 5-7 and 12-18. Thus, Claims 5-7 and 12-18 are believed to be patentably distinguished over Heikkilä. Accordingly, applicants respectfully request that the rejection of Claims 5-7 and 12-18 under 35 U.S.C. § 102(b) be withdrawn and the claims allowed at this time.

Claims 8 and 10 depend from Claim 7. Therefore, the comments presented above relating to Claim 7 apply equally to Claims 8 and 10. Thus, Claims 8 and 10 are believed to be patentably distinguished over Heikkilä. Applicants respectfully request

that the rejection of Claims 8 and 10 under 35 U.S.C. § 102(b) be withdrawn and the claims allowed at this time.

IV. Allowable Claims

The Examiner indicated that Claims 3, 9, and 11 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims. (Official Action, page 4.) New Claim 19 includes the features of independent Claim 2 and canceled dependent Claim 3. New Claim 20 includes the features of independent Claim 7, dependent Claim 8, and canceled dependent Claim 9. New Claim 21 includes the features of independent Claim 7, dependent Claim 10, and canceled dependent Claim 11. Therefore, it is respectfully submitted that Claims 19-21 are in form for formal allowance and applicants respectfully request same.

CONCLUSION

In light of the above amendments and remarks, it is respectfully submitted that the present application is now in proper condition for allowance, and an early notice to such effect is earnestly solicited.

If any small matter should remain outstanding after the Patent Examiner has had an opportunity to review the above Remarks, the Patent Examiner is respectfully requested to telephone the undersigned patent attorney in order to resolve these matters and avoid the issuance of another Official Action.

DEPOSIT ACCOUNT

The Commissioner is hereby authorized to charge any fees associated with the filing of this correspondence to Deposit Account No. **50-0426**.

Respectfully submitted,

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